

What is claimed is:

1 1. A broadcasting apparatus comprising:

2 a transmitting means for transmitting an interactive  
3 content as a data carousel over a span of a scheduled broadcasting  
4 time period; and

5 a transmission control means for controlling the  
6 transmitting means so as to (a) start pre-transmitting the  
7 interactive content a predetermined time before the start of the  
8 scheduled broadcasting time period, and (b) repeatedly transmit a  
9 cache message that instructs a receiving apparatus to cache the  
10 interactive content into a storage unit in the receiving apparatus  
11 while the transmitting means pre-transmits the interactive content  
12 over a span of the predetermined time period.

1 2. The broadcasting apparatus of Claim 1, wherein

2 the scheduled broadcasting time period spans from a time  
3 when the receiving apparatus is to start reproducing the  
4 interactive content to a time when the receiving apparatus is to  
5 end reproducing the interactive content.

1 3. The broadcasting apparatus of Claim 1, wherein

2 the transmission control means controls the transmitting  
3 means so as to transmit a reproduction message that conveys that  
4 the interactive content cached in the storage unit in the  
5 receiving apparatus should be reproduced over the span of the

6 scheduled broadcasting time period.

1 4. The broadcasting apparatus of Claim 3, wherein

2 the reproduction message (a) specifies a time when a  
3 reproduction should start and (b) includes an instruction to start  
4 the reproduction at the specified time, and

5 the transmission control means repeatedly transmits the  
6 reproduction message while the transmitting means pre-transmits  
7 the interactive content over the span of the predetermined time  
8 period.

1 5. The broadcasting apparatus of Claim 3, wherein

2 the reproduction message includes an instruction to  
3 start a reproduction immediately after the reproduction message is  
4 received, and

5 the transmission control means instructs the  
6 transmitting means to transmit the reproduction message at the  
7 start of the scheduled broadcasting time period.

1 6. The broadcasting apparatus of Claim 3, wherein

2 the transmission control means includes:

3 a schedule storage unit for storing a time 1, a time 2,  
4 and a time 3 which correspond to the interactive content, the time  
5 1 being a time when the transmitting means starts pre-transmitting  
6 the interactive content the predetermined time before the start of

7 the scheduled broadcasting time period, the time 2 being the start  
8 of the scheduled broadcasting time period, and the time 3 being  
9 the end of the scheduled broadcasting time period;

10 a data carousel control unit for controlling the  
11 transmitting means to transmit the interactive content over a span  
12 of the time 1 to the time 3 stored in the schedule storage unit;  
13 and

14 a message control unit for instructing the transmitting  
15 means to repeatedly transmit the cache message over a span of the  
16 time 1 to the time 2 stored in the schedule storage unit, and  
17 instructing the transmitting means to transmit the reproduction  
18 message at the time 2.

1 7. The broadcasting apparatus of Claim 1, wherein

2 the transmitting means further broadcasts a video  
3 content over the span of the scheduled broadcasting time period,  
4 the video content containing video and audio data, and

5 the interactive content is closely related to the video  
6 content.

1 8. The broadcasting apparatus of Claim 7, wherein

2 the video content is a commercial and is synchronized  
3 with the interactive content.

1 9. The broadcasting apparatus of Claim 7, wherein

2           the video content is one of a movie, a drama, a sports  
3 broadcast program, and a news broadcast program, and the  
4 interactive content is either an introduction or a detail of the  
5 video content.

1   10. The broadcasting apparatus of Claim 7, wherein

2           the transmission control means controls the transmitting  
3 means so as to transmit a reproduction message that conveys that  
4 the interactive content cached in the storage unit in the  
5 receiving apparatus should be reproduced over the span of the  
6 scheduled broadcasting time period.

1   11. The broadcasting apparatus of Claim 10, wherein

2           the reproduction message (a) specifies a time when a  
3 reproduction should start and (b) includes an instruction to start  
4 the reproduction at the specified time, and

5           the transmission control means repeatedly transmits the  
6 reproduction message while the transmitting means pre-transmits  
7 the interactive content over the span of the predetermined time  
8 period.

1   12. The broadcasting apparatus of Claim 10, wherein

2           the reproduction message includes an instruction to  
3 start a reproduction immediately after the reproduction message is  
4 received, and

5           the transmission control means instructs the  
6 transmitting means to transmit the reproduction message at the  
7 start of the scheduled broadcasting time period.

1   13. The broadcasting apparatus of Claim 10, wherein

2           the transmission control means includes:

3           a schedule storage unit for storing a time 1, a time 2,  
4 and a time 3 which correspond to the interactive content, the time  
5 1 being a time when the transmitting means starts pre-transmitting  
6 the interactive content the predetermined time before the start of  
7 the scheduled broadcasting time period, the time 2 being the start  
8 of the scheduled broadcasting time period, and the time 3 being  
9 the end of the scheduled broadcasting time period;

10          a data carousel control unit for controlling the  
11 transmitting means to transmit the interactive content over a span  
12 of the time 1 to the time 3 stored in the schedule storage unit;  
13 and

14          a message control unit for instructing the transmitting  
15 means to repeatedly transmit the cache message over a span of the  
16 time 1 to the time 2 stored in the schedule storage unit, and  
17 instructing the transmitting means to transmit the reproduction  
18 message at the time 2.

1   14. A receiving apparatus comprising:

2           a receiving means for receiving an interactive content

3 which is transmitted as a data carousel;

4 a reproducing means for reproducing the received  
5 interactive content; and

6 a reception control means for controlling the  
7 reproducing means so as to (a) cache the interactive content into  
8 a storage unit, not reproducing the interactive content, while the  
9 interactive content is received before the start of a scheduled  
10 broadcasting time period, and (b) reproduce the interactive  
11 content during the scheduled broadcasting time period.

1 15. The receiving apparatus of Claim 14

2 further receiving a cache message that instructs to  
3 cache the interactive content, wherein

4 the reception control means caches the interactive  
5 content into the storage unit in accordance with the received  
6 cache message.

1 16. The receiving apparatus of Claim 15

2 further receiving a reproduction message that instructs  
3 to start reproducing the interactive content, wherein

4 the reception control means reproduces the interactive  
5 content cached in the storage unit in accordance with the received  
6 reproduction message.

1 17. The receiving apparatus of Claim 16, wherein

2           the reception control means starts reproducing the  
3 interactive content cached in the storage unit, upon receipt of  
4 the reproduction message.

1 18. The receiving apparatus of Claim 16, wherein

2           the reception control means reproduces the interactive  
3 content cached in the storage unit, starting at a time indicated  
4 by the received reproduction message.

1 19. A broadcasting system including a broadcasting apparatus and  
2 a receiving apparatus, wherein

3           the broadcasting apparatus comprises:

4           a transmitting means for transmitting an interactive  
5 content as a data carousel over a span of a scheduled broadcasting  
6 time period; and

7           a transmission control means for controlling the  
8 transmitting means so as to (a) start pre-transmitting the  
9 interactive content a predetermined time before the start of the  
10 scheduled broadcasting time period, and (b) repeatedly transmit a  
11 cache message that instructs a receiving apparatus to cache the  
12 interactive content into a storage unit in the receiving apparatus  
13 while the transmitting means pre-transmits the interactive content  
14 over a span of the predetermined time period, and

15           the receiving apparatus comprises:

16           a receiving means for receiving the interactive content

17 transmitted as the data carousel;

18 a reproducing means for reproducing the received  
19 interactive content; and

20 a reception control means for controlling the  
21 reproducing means so as to (a) cache the interactive content into  
22 a storage unit, not reproducing the interactive content, while the  
23 interactive content is received before the start of a scheduled  
24 broadcasting time period, and (b) reproduce the interactive  
25 content during the scheduled broadcasting time period.

1 20. A broadcasting method of allowing a broadcasting apparatus to  
2 transmit a data carousel, comprising:

3 a first transmitting step for pre-transmitting an  
4 interactive content as the data carousel, starting a predetermined  
5 time before the start of a scheduled broadcasting time period;

6 a cache message transmitting step for repeatedly  
7 transmitting a cache message that instructs a receiving apparatus  
8 to cache the interactive content into a storage unit in the  
9 receiving apparatus while the interactive content is pre-  
10 transmitted in the first transmitting step; and

11 a second transmitting step for broadcasting the  
12 interactive content as the data carousel during the scheduled  
13 broadcasting time period.

1 21. The broadcasting method of Claim 20, wherein



2           the scheduled broadcasting time period spans from a time  
3 when the receiving apparatus is to start reproducing the  
4 interactive content to a time when the receiving apparatus is to  
5 end reproducing the interactive content.

1   22. The broadcasting method of Claim 21 further comprising:

2           a reproduction message transmitting step for  
3 transmitting a reproduction message that instructs the receiving  
4 apparatus to reproduce the interactive content cached in the  
5 storage unit when a transmission starts at some time in either the  
6 first transmitting step or the second transmitting step.

1   23. A computer readable medium for use with a computer, storing  
2 a computer program that allows a broadcasting apparatus to  
3 transmit a data carousel, the computer program allowing a computer  
4 in the broadcasting apparatus to execute:

5           a first transmitting step for pre-transmitting an  
6 interactive content as the data carousel, starting a predetermined  
7 time before the start of a scheduled broadcasting time period;

8           a cache message transmitting step for repeatedly  
9 transmitting a cache message that instructs a receiving apparatus  
10 to cache the interactive content into a storage unit in the  
11 receiving apparatus while the interactive content is pre-  
12 transmitted in the first transmitting step; and

13          a second transmitting step for broadcasting the

14 interactive content as the data carousel during the scheduled  
15 broadcasting time period.

1 24. A computer program that allows a broadcasting apparatus to  
2 transmit a data carousel, the computer program allowing a computer  
3 in the broadcasting apparatus to execute:

4 a first transmitting step for pre-transmitting an  
5 interactive content as the data carousel, starting a predetermined  
6 time before the start of a scheduled broadcasting time period;

7 a cache message transmitting step for repeatedly  
8 transmitting a cache message that instructs a receiving apparatus  
9 to cache the interactive content into a storage unit in the  
10 receiving apparatus while the interactive content is pre-  
11 transmitted in the first transmitting step; and

12 a second transmitting step for broadcasting the  
13 interactive content as the data carousel during the scheduled  
14 broadcasting time period.